Arguments/Comments in Initial Amendment in RCE

This Initial Amendment in RCE is being submitted in conjunction with the Request for Continuing Examination (RCE) filed herewith, and is generally in response to the Office Action of Oct. 16, 2003 in the initial prosecution, in which Claim 8 had been allowed and Claims 1-7 had been under final rejection. The Response to Office Action After Final Rejection submitted by Applicants on Nov. 14, 2003 (dated Nov. 12, 2003) was denied entry. It is Applicants request that such earlier submission **not be entered** herewith, but instead be replaced by the present Initial Amendment in RCE. This will minimize the need to submit, in effect, 2 amendments, when the present single amendment will do. [NOTE: the pages of this amendment following page 8 are numbered manually owing to an inability to achieve same through word processing techniques.]

Independent Claims 1 and 8 are amended herewith to more clearly state the invention and advance the prosecution. New method claims 9 and 10, depending from allowed method claim 8, are submitted herewith as "method counterparts" to apparatus claims 3 and 6 respectively. New independent "apparatus" claim 11 and new dependent claims 12-20 depending therefrom, are submitted herewith for entry.

Claim 1 has been amended to indicate a) in the preamble, that the objective of the claim is to provide a keep-warm system to provide freeze protection for a fuel cell power plant, and b) in the concluding portion of the claim, that the recited combination of structure is "thereby to prevent freezing of water in freeze-sensitive parts of the fuel cell power plant". This is intended to distinguish the character and functioning of the recited structure from any such structure that does not specifically "prevent freezing of water in a fuel cell power plant".

The allowed independent method Claim 8 has been amended to clarify the scope of the invention. This has been done by deleting specific recitation of a cooler in the fuel cell stack assembly (CSA) of that broadest method claim. It should be evident that the patentability of that claim resides not in whether or not the CSA has a cooler, but rather, in that the power plant has a water management system that is

operatively connected to the CSA and that the method and objective of the invention is to prevent freezing of water in freeze-sensitive parts of the fuel cell power plant during shutdown. While it is appropriate to recite the CSA as having an anode, a cathode, and electrolyte, and further that the CSA is operatively connected to a water management system, not every CSA with which the invention of Claim 8 is applicable necessarily includes a specific channel designated a "cooler". Thus, it is deemed appropriate to omit such recitation from the structure of Claim 8. On the other hand, that "cooler" structure has been retained in the recitation of the CSA of Claim 1.

The new independent apparatus claim 11 is nearly the same as Claim 1, but omits any specific recitation of a "cooler" in elements a. and d. Claim 11 serves as the basis for an additional group of dependent claims (12-20), some of which (12, 15-18, and 20) are duplicates of some of the dependent claims 2-7 and others of which differ in the manner to be described hereinbelow.

Claim 13 requires the catalytic burner means (66) to be separate from the CSA (12). The importance of this distinction is discussed on page 3, lines 1-22 of the application. Clearly this claim recites a keep-warm system different from those that rely on the CSA for the catalytic combustion required for the heat. Moreover, the separateness/independence of the present burner means affords latitude in selecting the best location for the heat generation without the limitations associated with use of the CSA for that purpose.

Claim 14, which depends from claim 13, specifically recites the inclusion of a cooler (20) in the CSA, and that the water management system is connected to the cooler.

Claim 19 depends directly from claim 11 and is somewhat complex in its wording. It is the general intent of this claim to add specificity to the thermal insulating means (64) to yield the claimed result, to wit, "prevent freezing of water in freeze-sensitive parts of the plant for at least several days at external temperatures as low as -40^0 C". The claim states that "the insulation value of the thermal insulating means (64), as determined by at least the 'R' value and thickness of said thermal insulating means" is sufficient to achieve that result. The support for these values is found on pages 12 and 13 and Fig. 2 of the application. However, beyond the foregoing, the claim further correlates such insulation value and freeze-prevention performance with a referenced amount of hydrogen consumption by the burner for an exemplary referenced PEM CSA. This is done to avoid an assertion that even the

scantest of insulation could provide the claimed freeze prevention if sufficient hydrogen were burned. In order not to be limited to only the referenced PEM CSA, the claim uses the phrase "for a system scaled commensurately with a consumption . . ." This is intended to indicate that the 0.014 pph of hydrogen consumed could be either more or less, as a scaled function of the size of the CSA being "protected" relative to a 75 kw PEM CSA. It is submitted that none of the references disclose or teach such a system having the claimed insulation values capable of yielding the claimed results (prevent freezing for long duration under extreme cold with only limited hydrogen consumption).

Referring to the earlier rejections of Claims 1-7, Applicants wish to repeat, through incorporation by reference, the arguments and distinguishing comments submitted with their Response dated May 20, 2003. As clearly recited by Claim 1 as now amended, the invention has as its claimed purpose the prevention of freezing of water in freeze-sensitive parts of the fuel cell power plant. This is accomplished via the novel arrangement and functioning of elements as recited in Claim 1. Briefly and simply stated, there is provided a CSA, a fuel supply, a source of oxidant reactant, a water management system, and importantly, a thermal insulating enclosure for one or more of the CSA and the water management system, and a catalytic burner. The burner catalytically reacts fuel and oxidant to provide heat, and is disposed such that the heat is provided into the thermal insulating enclosure. The dependent claims 2-7 recite the character of the catalytic burner, the combustion reaction process and temperature, the use of air and pressurized hydrogen as the reactants for the burner, and that both the CSA, which is a PEM, and the water management system are within the thermal insulating enclosure. This arrangement affords a fuel and energy-efficient means for keeping the critical elements from freezing for long intervals of 7 days or more under external freezing conditions.

The arguments of the preceding paragraph are repeated with respect to new claims 11 – 20, with additional emphasis on each of the further limitations that appear in claims 13 and 19, respectively, as discussed above. Clearly none of the references render these claims anticipated or obvious.

Neither the Acker, the Gebhardt, et al, nor the Tomomura references in any way teach the use of a catalytic burner and a thermal insulating means for providing a keep-warm system to prevent freezing of water-sensitive parts of the fuel cell power plant. Since clearly no single one of the applied references provides all of the claimed

structure, the Examiner relies upon a combination of references in making the rejections. Yet, to make such combination, there must be a teaching or suggestion of doing so and then, the resultant structure must meet all of the elements and their functional interactions and results as recited in the Claims. That simply does not occur with respect to the applied references.

The Examiner, in his Response contained in the Office Action of Oct. 16, again relies mainly on an assertion that the fuel cell system of Acker "resides outside of an airspace (e. g., a house) and is connected to an air circulation path with an interior region of the air space via a cathode inlet conduit and a cathode outlet conduit." Applicants will acknowledge that that is what Acker discloses, however the Examiner's comments go on to say "the system is analogous to a residential heat pump unit, which has a casing to prevent the components for (sic) direct exposure to the ambient" and "(T)hus, the casing of the fuel cell system is considered as a thermal insulating means, which encloses the fuel cell stack and the cooling subsystem".

In actuality, nowhere does the Acker reference show, mention, disclose or suggest "thermal insulating means enclosing at least one of the CSA and the water management system for providing thermal insulation thereof". Indeed, nowhere does it suggest any kind of thermal insulating enclosure. The so-called "casing" (14) of Fig. 2 of Acker is simply a 3-dimensional block diagram said to actually be the "fuel cell system", which includes the fuel cell stack 50. It is from this that the Examiner develops the strained hypothesis that a.) Acker must be showing some sort of enclosure (why?), and b.) that the fuel cell system of Acker is purportedly analogous to a heat pump, which has a casing, and further, c.) that heat pump casings are to protect heat pump elements from the ambient, and still further d.) that thus the imagined casing of the fuel cell system of Acker is considered as a thermal insulating means enclosing a fuel cell stack and cooling system.

Firstly, the Examiner's reasoning is based on suppositions that simply are not supported by the actual prior art under consideration. Secondly, even if one were to accept that Acker somehow discloses a "casing", which Applicants vigorously challenge, there simply is not adequate support for the assertion that such a casing is thermally insulating and is for the purpose, in combination with a catalytic fuel

burner, of preventing freezing of freeze-sensitive parts of the fuel cell power plant, as is now clearly recited in Claims 1 and 11. Moreover, there is clearly no showing or teaching of the structural characteristics of either of new claims 13 and 19. While the "insulating value" of the "thermal insulating means" of claim 19 is quantified or expressed in terms of result (no freeze for quantified long time under quantified very cold conditions), it is also further quantified by the limited amount of hydrogen required to fuel the burner. Clearly, the cited references, and particularly Acker, have no such teaching.

For the forgoing reasons, it is respectfully submitted that the references fail to fairly or reasonably suggest the claimed invention, particularly in view of Claim 1 as amended herewith and new claims 11 – 20 submitted herewith that reflect the freeze protection capability. Accordingly, entry of this amendment is respectfully requested, and favorable consideration/reconsideration is respectfully solicited. If any issue(s) remains, or arises, that might be resolved by telephone, it is respectfully requested that Applicant's attorney be contacted at telephone: (860) 313-4402.

Respectfully submitted,

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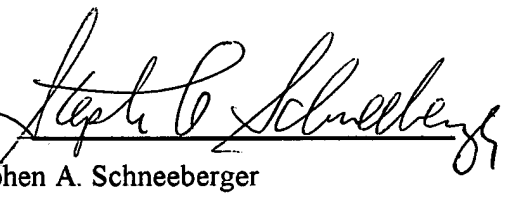
By: 

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Date: Dec. 19, 2003

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